September 11, 1998

MEMORANDUM

TO:

Susan J. Richards, Chief Air Quality Permitting Bureau Air and Hazardous Waste

FROM:

Yihong Chen, Air Quality Engineer

Air Quality Permitting Bureau Operating Permits Section

THROUGH:

Daniel Salgado, Air Quality Permits Manager

Air Quality Permitting Bureau
Operating Permits Section

SUBJECT:

Technical Analysis for Tier II Operating Permit (#777-00140)

Bannock Paving Company, Inc. (Portable Hot-Mix Asphalt Plant, Cedarapids #1)

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 16.01.01 Sections 400 through 406 (Rules for the Control of Air Pollution in Idaho) for issuing Operating Permits.

PROJECT DESCRIPTION

Bannock Paving Company, Incorporated, intends to operate their Portable Hot-Mix Asphalt (HMA) Plant, Cedarapids #1; in conjunction with their Portable Rock Crushing Plant, Crusher #1, in both attainment and non-attainment areas throughout the state of Idaho. Both facilities are allowed to operate separately by current PTC #777-00140, dated February 28, 1997, and PTC #777-00141, dated October 4, 1995. The project is to issue a Tier II Operating Permit (OP) for the Portable Hot-Mix Asphalt Plant, Cedarapids #1; and a Tier II OP for the Portable Rock Crushing Plant, Crusher #1; to establish minor source status for their co-located operations. These two Tier II OPs will supersede the current corresponding PTCs. In addition, the change of generator from 400-kW to 1,300-kW has been included in the analysis and this permit.

SUMMARY OF EVENTS

On June 9, 1998, a meeting was held at the Division of Environmental Quality (DEQ) between Bannock Paving Company and DEQ representatives. On June 19, 1998, DEQ sent a follow-up letter to Bannock Paving Company to confirm the Tier II OPs' issuance. During the month of June and July, there were several phone conversations between Bannock Paving Company and DEQ to discuss permit limits and monitoring issues.

On July 29, 1998, a proposed Tier II OP was issued for public comment. The public comment period was held from July 29, 1998, through August 28, 1998. No comments were received.

DISCUSSION

1. Process Description

The facility is a portable drum-mix hot-mix asphalt plant used for the production of asphaltic concrete. The dryer burner is fired on either distillate or residual fuel oils (ASTM grades 2 through 6).

2. Equipment Listing

This permit analysis includes the following equipment as provided by the company or listed in the technical memo for the current PTCs:

2.1 Portable Hot-Mix Asphalt Plant

Manufacturer/Model:

Cedarapids

Type:

Drum-Mix 450 T/hr

Production Capacity:

ASTM grades 2 through 6 fuel oil

Burner Fuel Type: Dryer Heat Input:

120,000 Btu/hr

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2.2 Air Pollution Control Device

Type:

Standard Havens Baghouse

Manufacturer: Havens

Model: Alpha Mark III

2.3 HMA Stack Information

Stack Height: Stack Diameter: 39 ft 5.15 ft

Exhaust Gas Flow Rate:

33,395 ACFM

Stack Exhaust Temp.:

261°F

3. Area Classification

The HMA facility is a portable source and may operate in both attainment and non-attainment areas throughout the state of Idaho.

4. Emission Estimates

4.1 Hot-Mix Asphalt Plant, Cedarapids #1 Co-Located with Rock Crushing Plant, Crusher #1

Allowable emissions and throughput limits of each plant were calculated by Yihong Chen of DEQ using spreadsheets (HMA + Crusher) developed specifically for estimating emissions from Portable HMA Plants and Portable Crushing Plants. The calculation mechanism behind the spreadsheet is the same as that for general permit spreadsheets. The only difference is that this spreadsheet addresses colocated operations of the HMA plant and the Crushing plant. The spreadsheet ensures that the overall facility-wide potential controlled emissions of any criteria air pollutant from the HMA plant and the Crushing plant are below 99 T/Yr. In addition, all applicable National Ambient Air Quality Standards (NAAQS) will be met in attainment areas and there will be no significant contribution to a NAAQS violation in PM-10 and CO non-attainment areas under such co-located operations. The spreadsheet can be seen in Appendix A of this memo, and a control technology analysis performed by Krishna Viswanathan, TSB Air Quality Engineer, can be seen in Appendix B.

Sulfur dioxide (SO₂) is the only pollutant that requires a limit to maintain minor status for co-located operations. SO₂, and all other pollutants, are limited by allowing a maximum asphalt production rate of 936,000 T/Yr for the HMA plant, a maximum crushing throughput rate of 1,662,750 T/Yr for the Rock Crushing Plant, and a maximum operating schedule of 2,217 hr/Yr for the Generator associated with the Rock Crushing Plant.

The above limits inherently ensure that all applicable NAAQS are met in attainment areas.

For non-attainment areas, since currently there are only PM-10 and/or CO non-attainment areas in Idaho, the throughput limits calculated by the spreadsheet (HMA + Crusher) in this permit only ensure no significant contribution to a PM-10 or a CO NAAQS violation. PM-10 was determined to be the most limiting pollutant. The resultant limits are a maximum allowable asphalt production of 3,195 T/day for the HMA plant, and a maximum allowable operating schedule of fifteen (15) hr/day for the Generator associated with the Rock Crushing Plant.

4.2 Hot-Mix Asphalt Plant, Cedarapids #1 - Operated Alone

The facility will comply with the same annual limits as that in the above section (Section 4.1). These limits ensure that the facility will be a minor source and will meet all applicable NAAQS in attainment areas.

For non-attainment areas, the current DEQ general permit spreadsheet for HMA plants was used. It can be seen in Appendix A of this memo. The limit given by the HMA spreadsheet is a maximum allowable asphalt production rate of 6,194 T/day. This limit ensures no significant contribution to a NAAQS violation in non-attainment areas when one HMA plant is operated alone.

5. Modeling

Modeling of the asphalt dryer stack emissions was conducted using the EPA approved SCREEN3 computer model. The maximum one (1) hour impact from the dryer stack was calculated to be 3.25 μ g/m³ using a one (1) lb/hr emission rate input to the model. The modeling results can be seen in Appendix C of this memo.

Modeling of emissions from the Rock Crusher generator stack was conducted using the EPA approved SCREEN3 computer model. The maximum one (1) hour impact from the dryer stack was calculated to be 13.13 μ g/m³ using a one (1) lb/hr emission rate input to the model. The modeling results can be seen in Appendix C of this memo.

The NAAQS for PM-10 is 150 μ g/m³, twenty-four (24) hour average period; and fifty (50) μ g/m³, annual arithmetic mean. For CO, it is 10,000 μ g/m³, eight (8) hour average period; and 40,000 μ g/m³, one (1) hour average period. For NO_x, it is 100 μ g/m³, annual arithmetic mean. For SO₂, it is 1,300, three (3) hour average period; 365 μ g/m³, twenty-four (24) hour average period; and eight (80) μ g/m³, annual arithmetic mean.

The background concentration of the pollutants are taken from the current HMA general permit spreadsheet. For PM-10, it is eighty-six (86) μ g/m³, twenty-four (24) hour average period; and 32.7 μ g/m³, annual arithmetic mean. For CO, it is 5,130 μ g/m³, eight (8) hour average period; and 11,400 μ g/m³, one (1) hour average period. For NO_x, it is forty (40) μ g/m³, annual arithmetic mean. For SO₂, it is 543 μ g/m³, three (3) hour average period; 144 μ g/m³, twenty-four (24) hour average period; and 23.5 μ g/m³, annual arithmetic mean.

The allowable impact concentration is calculated as NAAQS minus background concentration. For PM-10, it is sixty-four (64) μ g/m³, twenty-four (24) hour average period; and 17.3 μ g/m³, annual arithmetic mean. For CO, it is 4,870 μ g/m³, eight (8) hour average period; and 28,600 μ g/m³, one (1) hour average period. For NO_x, it is sixty (60) μ g/m³, annual arithmetic mean. For SO₂, it is 757 μ g/m³, three (3) hour average period; 221 μ g/m³, twenty-four (24) hour average period; and 56.5 μ g/m³, annual arithmetic mean.

For PM-10 and CO non-attainment areas, under IDAPA 16.01.01.006.89, the significant contribution for PM-10 is five (5) μ g/m³, twenty-four (24) hour average period; and 1.0 μ g/m³, annual arithmetic mean. For CO, it is 500 μ g/m³, eight (8) hour average period; and 2,000 μ g/m³, one (1) hour average period.

The factors to convert the impact from a one (1) hour average period to an eight (8) hour, twenty-four (24) hour, and annual average period are 0.7, 0.4 and 0.08, respectively.

5.1 Hot-Mix Asphalt Plant, Cedarapids #1 Co-Located with Rock Crushing Plant, Crusher #1

The HMA + Crusher spreadsheet calculates the ambient impact for each air pollutant (PM-10, NO_x, SO₂ and CO) based on the calculated lb/hr emission rate, averaging periods and background concentrations. By trial and error, and using the spreadsheet, a set of operating limits must be chosen that meet the following criteria: 1) facility-wide potential controlled emissions of each criteria air pollutant from the HMA plant and the Crushing plant are below 99 T/Yr; 2) all applicable NAAQS are met in attainment areas; and 3) no significant contribution to PM-10 and CO NAAQS violation. By discussing with the company and giving the maximum flexibility for the co-located operations, the optimum limit combination has been chosen.

In attainment areas, for example, the twenty-four (24) hour impact of PM-10, under permitted limits, from the dryer and the generator is 12.5 $\mu g/m^3$, which is calculated by the following method: 3.25 $\mu g/m^3/(1 \text{ lb/hr}) \times 6.7 \text{ lb/hr} \times 0.4 + 13.13 <math>\mu g/m^3/(1 \text{ lb/hr}) \times 0.7 \text{ lb/hr} \times 0.4$. The annual impact of PM-10 from the dryer and the generator is 0.6 $\mu g/m^3$, which is calculated by the following method: 3.25 $\mu g/m^3/(1 \text{ lb/hr}) \times 6.7 \text{ lb/hr} \times 0.08 \times 2080 \text{ hr}/8760 \text{ hr} + 13.13 <math>\mu g/m^3/(1 \text{ lb/hr}) \times 0.7 \text{ lb/hr} \times 0.08 \times 2217 \text{ hr/8760 hr}$. To compare the source impact of PM-10 with its corresponding allowable impact, it can be seen that all PM-10 NAAQS are met. The same methodology is used for other pollutants.

In non-attainment areas, the twenty-four (24) hour impact of PM-10, under permitted limits, from the dryer and the generator is 5 μ g/m³, which is calculated by the following method: 3.25 μ g/m³/(1 lb/hr) x 6.7 lb/hr x 7.1/24 x 0.4 + 13.13 μ g/m³/(1 lb/hr) x 0.7 lb/hr x 15/24 x 0.4. The annual impact is the same as aforementioned. The same methodology is used for CO. To compare the source impact of PM-10 and CO with the corresponding significant contribution levels, it can be seen that PM-10 is the limiting pollutant.

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5.2 Hot-Mix Asphalt Plant, Cedarapids #1 - Operated Alone

The general permit HMA spreadsheet calculates the ambient impact for each air pollutant (PM-10, NO_x, SO₂ and CO) based on the calculated lb/hr emission rate, averaging periods and background concentrations. The spreadsheet solves for the most limiting pollutant in attainment areas and gives appropriate operational limits which protects the applicable NAAQS as defined in IDAPA 16.01.01.577. In addition, the spreadsheet also calculates the most limiting pollutant in non-attainment areas and gives operational limits to protect applicable significant contribution requirements as defined in IDAPA 16.01.01.006.89.

6. Facility Classification

This facility is not a designated facility, as defined in IDAPA 16.01.01.006.25. This facility is not a major facility as defined in IDAPA 16.01.01.008.14. This facility is an affected facility and is subject to regulation in accordance with 40 CFR Part 60, Subpart I, "Standards of Performance for Hot-Mix Asphalt Facilities", because the facility is a hot-mix asphalt plant that has commenced construction or modification after June 11, 1973.

The facility classification is A2 and the Standard Industrial Classification code (SIC) is 2951.

Regulatory Review

This operating permit is subject to the following permitting requirements:

a.	IDAPA 16.01.01.123	Certification of documents
b.	IDAPA 16.01.01.135	Excess Emissions Reports
C.	IDAPA 16.01.01.401	Tier II Operating Permit.
d.	IDAPA 16.01,01,403	Permit Requirements for Tier II Sources.
e.	IDAPA 16.01.01.404.01.c	Opportunity for Public Comment.
f.	IDAPA 16.01.01.404.04	Authority to Revise Operating Permits.
g.	DAPA 16.01.01.406	Obligation to Comply.
ň.	IDAPA 16.01.01.470	Permit Application Fees for Tier II Permits.
1.	IDAPA 16.01.01.500	Registration Procedures and Requirements for Portable equipment.
i.	IDAPA 16.01.01.625	Visible Emission Limitation.
k.	IDAPA 16.01.01.650	General Rules for the Control of fugitive dust.
1	IDAPA 16.01.01.727	Residual Fuel Oil
i	IDAPA 16.01.01.728	Distillate Fuel Oil
k.	IDAPA 16.01.01.805	Rules for Control of Hot-Mix Asphalt Plants.

Standards of Performance for Hot-mix Asphalt Plants

FEES

L.

Fees apply to this facility in accordance with IDAPA 16.01.01.470. The facility is subject to permit application fee for the Tier II permit of five hundred dollars (\$500.00).

AIRS

The AIRS database for Bannock Paving's Hot-Mix Asphalt Plant, Cedarapids #1 (#777-00140) will be updated to include the new asphalt plant limitations as a result of the final permit issuance.

RECOMMENDATIONS

Based on the review of its current PTC, information provided by the company, and all applicable state and federal rules and regulations concerning the permitting of air pollution sources, the Bureau recommends that Bannock Paving Company, Inc., be issued a Tier II Operating Permit for the Portable Hot-Mix Asphalt Plant, Cedarapids #1. The facility has been notified in writing of the required Tier II application fee of five hundred dollars (\$500.00). The permit will be issued upon receipt of the fee.

SJR\DPS\YHC:jrj...\permits\bunnock\bpc-hma.TAM

cc: M. Lowe, Pocatello Regional Office Source File

40 CFR 60 Subpart I

COF

APPENDIX A

	The state of the s		
Bannock P	aving Company, Inc.	Date	07/08/98
	a1c1ana2.wk4	Engineer	Yihong Chen

A1 in conju	nction with C1 in attainme	nt and non-al	ainment areas			
Asphalt Pla	nt Cederapids #1					140
Dryer	Operating hour	2,080	n/Yr		-	
	Production rate	936,000	[/Yr			
	Additional operating cor	ditions for no	n-attainment ar	ea:	······································	······
	Daily operating hour	7.1	nr/day			
	Daily production rate	3,195	[/day			
	Model	3.25	.g/m^3@ 1 lb/h	hr, 1 hr from SCRE	EN3	
	ck Crushing Plant #1				······································	
Crusher	Operating hour	2,217	or/Yr	······································		
	Throughput	1,662,750	[/yr			
Generator	Operating hour	2,217	ar/Yr	······································	······································	
	Additional operating cor	nditions for n	n-attainment ar	ea;		
	Daily operating hour	15	hr/day			
	Model	13.13	.ig/m^3@ 1 lb/t	hr, 1 hr from SCREI	EN3	

Emissions	Dryer			Generator	······································	*********	Fugitive	Fugitive	Total
Pollutant	TAT	lb/hr		TAL	lb/hr		from HMA T/Yr	crush. screen T/Yr	T/Yr
PM	6	9	6,7	1.0	(9.0	7.0	120.2	135.2
PM-10	6.	9	6.7	0.8	. (0.7	2.6	46.0	56.4
co	16.	9	16.2	11.6	10	3.5			28.5
NOx	35.	1 :	33.7	44.4	40	0.0			79.5
SO2	91	8 1	88.2	7.2	•	3.5			99.0

Attai	mm	ent	A٢	e a

Allowable Im	pact = NAAC	s standards	- backgroun	d concentral	
	1-int	3-hr	8-lu	24-hr	Annual
PM-10				64	17.3
CO	28600	İ	4870	ł	
NOx	1				60
SO2	<u></u>	757		221	56.5

	NAAQs impact	NAAQs impact	NAAQs impact	NAAQs impact	NAAQs impact
	@1 hr	@ 3 hr 1hr con*.9	@ 3 hr	@ 24 hr 1hr con*.4	@annual 1 hr con*0.08
PM-10		1		12.5	0.0
CO	190.3		133.2		
√Ox					12.
SO2	1	335.0		148,9	7.3

	NAAQs impact @1 hr	NAAQs impact @ 3 hr	NAAQs impact @ 3 hr	NAAQs impact @ 24 hr	NAAQs impact @annual
PM-10				51	17
CO	28410		4737		1
NOx					47
SO2	1	422	-	72	49

Non-attainment Area

	(1-hr	3-hr	8-hr	24-hr	Annual
PM-10				5	1.0
CO	2000		500		
VOx		•	•		1.0
SO2		25		5	10

Impact from	Sources	······································			w/::
	NAAQs	NAAQs	NAAQs	NAAQs	NAAQs
	impact	impact	impact	impact	impact
	@1 hr	@ 3 hr	@ 3 hr	@ 24 hr	@annual
		1hr con*.9	1hr con*.7	1hr con*.4	1hr con*0.08
PM-10]			5.0	0.6
CO	190.3		133.2	İ	
NOx	1			i	12.7
SO2		335.0		55,3	7.2

Left Margin	=Significant Co	notubuton -	mpact from	Source	
	NAAQs impact @ 1 hr	NAAQs impact @ 3 hr	NAAQs impact @ 3 hr	NAAQs impact @ 24 hr	NAAQs impact @annual
PM-10				0.0	0.4
co	1810		367		
NOx					-12
502	<u> </u>	-310	<u> </u>	-50	-6

Note

Annual production = rated hourly production rate (a constant) x operating hours->

Emissions (T/Yr) are proportion to annual production ->

Therefor, emissions (T/Yr) are proportion to operating hours ->

- a) Emissions (E.general) & certain operating hours (t. general) were taken from general permit spreadsheet
 - Emissions (E) for this spreadsheet are calculated as: E≖ E,general A, general * €
- b) NAAQS impact (24 hr) = Dryer's ug/m^3 * daily operating hours/24 hr + Generator's ug/m^3 *daily operating hours/24
- c) NAAQS impact (annual) = Dryer's ug/m*3 * annual operating hours/8760 + Generator's ug/m*3 *annual operating hours/8760

INPUT SECTION - enter info in highlighted areas only

Company: Bannock Paving Company, Inc.						
Permit Engineer:	Ythong Chen					
Date:	06/26/96	1				
Filename:	A1sep.wk1					
IIMA Plant Type:	В	(A = Batch Mix Hot Mix Asphalt Plant)				
		(B = Drum Mix Hot Mix Asphalt Plant)				
Dryer Fuel Type:	c	(A = Natural Gas-Fired Dryer)				
		(B = Distillate Fuel Oil-Fired Dryer)				
		(C = Residual Fuel Oil-Fired Dryer)				
		(D = Waste Oil-Fired Dryer)				
Dryer Stack Flow Rate:	33,39	5 [=] actual cubic feet per minute (acfm)				
Dryer Stack Temperature:		= temperature (of)				
Dryer Stack Moisture Content:	20.00	= moisture wt % (Default 18 wt%)				
Dryer Stack Pressure:		= stack pressure (Default 29.92 "Hg)				
Corrected Flow Rate (calculated):	19,56	= dry standard cubic feet per minute (dscfm)				
Facility Production Capacity:	450	[=] Tom/hr				
Modeled 1-hr Concentration:	3.25	= µg/m3, at a unity emission rate of 1 lb/br				
ls a PM performance test						
required for this HMA plant?	N	(Y or N)				
Generator? (Y/N)	N	(Y or N)				

DRYER EMISSION RATE CALCULATIONS

	D	DRYER STACK				
	Emisson Factori	Emission Rate (Uncontrolled)	Emission Rate (Controlled)			
Pollutant	[=] lb/los	[=] [b/br	(Communico)			
Total PM	19.00	8,550.00	6.71			
	= gr/dscfm					
Total PM-10	0.04	1,935.00	6.71			
	[#] lb/ton		***			
CO NOx	6.04	16.20	16,20			
NO _x	0.08	33.75	33.75			
SO ₂	0.20	88.20	88.20			

HMA emission factors for CO, NOz, SO2 and uncontrolled PM & PM-10 are from AP-42 Section 11.1. Controlled PM & PM-10 is from the NSPS 0.04 gr/dscf.

SPREADSHEET DATA - information used by spreadsheet

	1-br	3-br	8-1	# 24-br	Aspu
PM-10				\$6	32,
co	11400		5130)	
NOx					4
SOx	1	\$43		144	23.
Fugitive Emission	Dets				***************************************
Mean Wind Speed	rary art alaman v.v.mnr.v.v.v.	10	l=l mph		
Material Molsture	Content (M)		1=1 %		
Particle Size Mult	iplier (k)		• •		
PM-10 (<10 µm	1)	0.35	[m] dimensioniess	•	
Emission Factors			• •		
PM-10 (<10 um	a)	0.0020	[**] 1b/T		
PM2			= b/T		
Notes:	: EF = k*0.0032*{{	3/5)^1.3/(M/2)^1.4			
Drop-Point Equat	ion, Rating "A." AP-	42, 5th Ed. p.13.2	.4-3.		
	Wind Speed = 10 mp				
Aggregate = 94			•		
	•				

FACILITY CLASSIFICATION INPUT

Facility Annual Emission Limit: 100 [=]T/yr
Note: Use 100 T/yr for Title V Limitation
Use 250 T/yr for PSD Limitation
For the standard HMA permit, use 100 T/yr.

GENERATOR EMISSION RATE CALCULATIONS

	GEN	GENERATOR STACK			
		Emission Rate	Emission Ret		
	Emisson Factor	(Uncontrolled)	(Controlled		
Poliutent	l≖i lb/ba-br	[=] lb/br	[∞] 1b/hi		
Total PM	N/A	0.00	0.00		
Total PM-10	N/A	0.00	0.00		
CO	N/A	0.00	0.00		
NOx	N/A	0.00	0.00		
SO ₂	N/A	0,00	0.00		

Generator emission factors are from AP-42 Section 3.3 and 3.4.

PERMIT REQUIREMENTS SECTION - enforceable permit limits

Facility Classification:

A2

Permit Emission Rate Limits		
	Allowable I	mission Limits
HMA Dryer Stack:	NA lb/hr	99.0 T/yr
•		of SO ₂
Permit Limits for Attainment and Unclass	ifiable Aren Onerstiens	
t ermit Limits for Attunment and Onciess	ijiuote Area Operations	
HMA Plant Throughput Limits:	NA T/day	1,010,204 T/yr
THE RESIDENCE OF THE PROPERTY		
Permit Limits for Nonattainment Area Op	erations	

MODELING ANALYSIS CALCULATIONS FOR ATTAINMENT AREAS.

PIOPERING ANALISIS CALCULAI	CHICATON ALLAN		***************************************		Seminaria de la companio del companio de la companio della compani	COLUMN TO THE THE TAX AND THE				~~~~
	Allowable Impacts			Permitted impacts						
		NAAQS		< 100 TPY				NAAQS		< 100 TPY
ĺ	Hours of	Hours of		Hours of	Hours of	Hours of	Calculated	Calculated		Calculated
	Operation	Operation		Operation	Operation	Operation	24-hr Impact	Annual Impact		Emissions
Pollutent	= br/day	= hr/year	Other abo	[=] hr/year	= br/day	= kr/yenr	[#] µg/ps.]	[≔] <u>×ø/æ</u> 3	Other abo	[*] top/year
PM	N/S	N/S			24.0	2,245				
PM-10	24.0	8,760		8,760	Based on:	Based on:	8.72	0.45		10.40
CO	N/S	N/S		8,760	None	SO₂	21.06	1,08		18.18
CO 1		1	1.0			***************************************			52.65	
СО в			8.0		Limited to 99.0	T/yr.		****	36.86	
NOx	N/S	8,760		5,867			-	2.25		37.88
SO ₂	24.0	8,760		2,245			114.66	5.88		99.00
SO ₂ ¢		l	3.0						257.99	

MUDELING ANALYSIS CALCULA	<u>Lions for nona</u>	<u>I TAINMENT ARI</u>	AS							
		Allowable Impacts			Permitted Impacts					
<u></u>		NAAQS		< 100 TPY				NAAQS		< 100 TPY
	Hours of	Hours of		Hours o	Hours o	Hours of	Culculated	Calculated		Calculated
	Operation	Operation		Operation	Operation	Operation	24-br Impact	Annual Impact		Emission
Pollutant	[=] hr/day	= hr/year	Otherak	= hr/yes	[=] br/day	[∞] hr/year	لم/وم (= ا	[=] La/gu	Other abs	i= ton/year
PM	N/S	N/S			13.8	2,245				
PM-10	13.8	5,024		8,760	Based on:	Based on:	5.00	0.45		10.40
CO	N/S	N/S		8,760	PM-10	SO ₂	12.08	1.08		18.18
CO ,			1.0	an read to				***	52.65	
CO s	1		8.0	# #	Limited to 99.0	T/yr.	·		36.86	
NO _x	N/S	8,760		5,867				.2.25		37.88
SO ₂	24.0	8,760		2,245			65.75	5.88		99.00
SO ₂ c			3.0						257.99	

FUGITIVE	FMISSION	CALCULAT	IONS FOR AT	TAINMENT	ARFAS

	PM	PM-10
Pre-Dryer Source Embalons (= lb/hr)		
Loader -> Cold Aggregate Bin	2.26	0.85
Cold Aggregate Bin -> Conveyor	2.26	0.85
Conveyor -> Drum Dryer	2.26	0.65
Total Pre-Dryer Source Emissions	6.77	2.56
Post-Dryer Source Emissions		
Screening Process	NA NA	NA
Screen -> Hot Bins	NA.	NA
Hot Bins -> Weigh Hopper	NA	NA
Weigh Hopper -> Pug Mill	NA.	NA
Total Post-Dryer Source Emissions	NA NA	NA
Scavenger Control Efficiency	NA	NA
Total Uncontrolled Emissions ([=] lb/hr)	6.77	2.56
Total Uncontrolled Emissions ([=] T/yr)	7.60	2.87
Total Controlled Emissions ([= lb/hr)	6.77	2.56
Total Controlled Emissions (i= T/yr)	7,60	2.87

al Controlled Emissions ([= tb/br)	6.77	2.56	

Source: National Asphalt Pavement Association

2 CO 1-hr Averaging Period b CO 8-hr Averaging Period c SO2 3-hr Averaging Period

	PM	PM-10
Pre-Dryer Source Emissions ([= lb/hr)		
Londer -> Cold Aggregate Bis	2.26	0.85
Cold Aggregate Bin -> Conveyor	2.26	0,85
Conveyor -> Drum Dryer	2.26	0.84
Total Pre-Dryer Source Emissions	6,77	3.86
Post-Dryer Source Emissions:		
Screening Process	NA NA	NA NA
Screen > Hot Bins	NA NA	NA
Hot Bins -> Weigh Hopper	NA NA	NA.
Weigh Hopper -> Pug Mill	NA NA	NA
Total Post-Dryer Source Emissions	NA	NA
Scavenger Control Efficiency	. NA	NA
Fotal Uncontrolled Emissions ([=] lb/hr)	6.77	2.56
Fotal Uncontrolled Emissions ([=] T/yr)	7.60	2.87
Fotal Controlled Emissions ([=] lb/hr)	6.77	2,56
Total Controlled Emissions (I=1 T/yr)	7.60	2.87

SPREADSHEET SUMMARY - results of emission and modeling calcs for all pollutants

Uncontrolled	Controlled	Dryer	Uncontrolled	Controlled
9596.9 Т/ут	7.5 T/yr	PM	9596.9 T/yr	7.5 T/yr
2171.9 T/yr	7.5 T/yr	PM-10	2171.9 T/yr	7.5 T/yr
18.2 T/yr	18.2 T/yr	СО	18.2 T/yr	18.2 T/yr
37.9 T/yr	37.9 T/yr	NOx	37.9 T/yr	37.9 T/yr
99.0 T/yr	99.0 T/yr	SO ₂	99.0 T/yr	99.0 T/yr
		Generator		
0.0 T/yr	0.0 T/yr	PM	0.0 T/yr	0.0 T/yr
0.0 T/yr	0.0 T/yr	PM-10	0.0 T/yr	0.0 T/yr
0.0 T/yr	0.0 T/yr	co	0.0 Т/уг	0.0 T/yr
0.0 T/yr	0.0 T/yr	NOx	0.0 T/yr	0.0 T/yr
0.0 T/yr	0.0 T/yr	SO ₂	0.0 T/yr	0.0 T/yr
		Fugitives		
7.6 T/yr	7.6 T/yr	PM	7.6 T/yr	7.6 T/yr
2.9 Т/уг	2.9 T/yr	PM-10	2.9 Т/уг	2.9 T/yr
777777777777777777777777777777777777777		Total :	<u> </u>	
9604.5 T/yr	15.1 T/yr	PM	9604.5 T/yr	15.1 T/yr
2174.8 T/yr	10.4 T/yr	PM-10	2174.8 T/yr	10.4 T/yr
18.2 T/yr	18.2 T/yr	co	18.2 T/yr	18.2 T/yr
37.9 Т/уг	37.9 T/yr	NOx	37.9 T/yr	37.9 T/yr
99.0 T/yr	99.0 T/yr	SO ₂	99.0 T/yr	99.0 T/yr
2174.8 [=] T/yr	99.0 [= T/yr	Title V PTE	2174.8 [=] T/yr	99.0 [=] T/yr
of PM-10	or so2	Summary 2	of PM-10	of SO2
9604.5 [= T/yr	99.0 [=] T/yr	Facility PTE	9604.5 = T/yr	99.0 [=] T/yr
of PM	er so2	Summary	of PM	of SO2
nforceable Limits Attainment Areas			Enforceable Limits - Non-At	
24.0 hr/day	2,245 hr/yr		13.8 hr/day	2,245 hr/yr
		Emission		
ryer Controlled Emission Rates		Limits	Dryer Controlled Emission R	
6.7 lb/hr	7.5 T/yr	PM/PM-10	6.7 lb/hr	7.5 T/yr
16.2 lb/hr	18.2 T/yr	co	16.2 lb/hr	18.2 T/yr
33.8 lb/hr	37.9 T/yr	NOx	33.8 lb/hr	37.9 T/yr
88.2 lb/hr	99.0 T/yr	SO2	88.2 lb/hr	99.0 Т/уг
enerator Controlled Emission Rates		Emission Limits	Generator Controlled Emissic	on Rates
0.0 lb/hr	0.0 T/yr	PM-10	0.0 lb/hr	0.0 T/yr
0.0 lb/hr	0.0 T/yr 0.0 T/yr	CO CO	0.0 lb/hr	0.0 T/yr
0.0 lb/hr	0.0 T/yr	NOx	0.0 lb/hr	0.0 T/yr
0.0 lb/hr	0.0 T/yr 0.0 T/yr	SO ₂	0.0 lb/hr	0.0 T/yr

¹ Total is the dryer, generator and fugitives added together for total PTE.
2 Title V PTE summary does not account for PM, only PM-19.

Cruster Plant Emission Calculations and Impact Estimates

DATA ENTRY

Company Na	ne: Barnock Pavery Company, Inc.	Enginest:	Yibong Chen
Project:	Portable Cruster	Date:	08.kdi.96
PTC #:		Fleranse:	Cisep02.wk)
<u> </u>			

Crusher Resility Information

Facility Production Cornelly:

Applicant's

Requested Hours of Operation:

Estimated Throughput:

6,525,000 [=] truly:

Maximum Hours of Operation:

8,764 [=] hrs/r

Maximum Throughput:

6,570,000 [=] tons/r

Namber of Crushers:

4,44

Generator Referention

Generator Size:

1,300 [=] AW

1,742.91 Conversion Factor

Violate:

B

(A = Horsepower)

(B = Kilowatia)

Fixel Type:

A

(A = Diesel-Fired Generator)

B = Gesoline-Fired Generator)

Fixel Usage:

94.9 gal/fr

Fixel Healing Value:

12,912.5685 [=] MMSturbx

13.13 (=) unims, at emission rate of 1 living

Drog Polité Famination Factions		
Mean Wind Speed (U)	10	i≠imok "
Mintertal Mointaire Cordent (M)	2.5	i=1%
Purticle Size Multiplier (k)		• •
PM-10 (<10 µm)	0.35	(a) dimension/ess
PM (<36 pm)		[=] dimension(ess
Emission Factor:		• • • • • • • • • • • • • • • • • • • •
PM-t+ (<3+μm)	0.0628	# lb/tos
PM:	0.0053	f=lik/ton
		[#] Ryton
There is the cutter narrantees a single-constant		

Notes: 1 PM = @*0.0032*(U/S)*1.3/(M/2)*1.4/0.8

		cround Contentratio	n Altehoment/Nen	Christiable Areas fo	e/m3)
		_,			
	3-14	3-1-1	8-74	24-₹±	Agrai
PM					
M-10				36.0	32.
70	11,480		3,130		
łO _r					40,0
Ot .		541		144	23.1
oc .					

OUTPUT

Medicled I he Concentration:

Potential to Emit - Based on Applicant's Data

Cruelser, Screens & Transfer Points	Uncontroll	ed Emissions	Controlle	Emusions
PM	1,570	tom/yr	471	tons/yr
PM-10	597	tone/yr	179	tone/yr
Generator				
PM	3.9	tom/yr	3.9	tone/yr
PM-10	3.2	tom/yr	3.2	tom/yr
co	43.5	lone/yr	45.5	tons/yr
NO _k	174.1	tons/yr	174.1	Lopus/yr
5O2	28.4	tons/yr	38.4	tone'yr
TOC	5.6	tone/yr	5.6	tons/yr
Total Cresher + Generator				
PM	1.574	tome/yr	473	toms/yr
PM-10	500	tone/yr	187	tora/yr
PTE Sussessary	1573.7	[=] T/w	474.8	[=] T/yr
	of.	PM	of	PM
Enfortenble Limiks Bused on Requested (Operations	***************************************		
Generator Operation	24.0	hrw/day	1,708	lat fyr
Crusher Production	18,000	T/day	6.53	MARTY
DEQ Classification;	Al	 	······································	

Potential to Exist ... Emissione Analysis Using Ambient Air Quality Standards Emissions insuled to best than:

Assumptions: Plant operations limited by NAAQS from generator emissions, and, Comber emissions back-calculated to yield 99 Form/yr of emissions.

Attainment/Non-Clessifishie					Non-Atlainment Ares			
Uncontrolled Ernisa	cesa	Controlled Essimion	#	Crenter	Uncontrolled Erris	uioon .	Controlled Emiss	ione
323 tom/yr		97 tons/yr		PM:	323 tona/y	г	97 tone'y	+ "
123 tom/yr		37 tam/yr		PM-10	§ 23 tone/y	r	37 toxin/21	
				Generator	1			
2.7 tome/yr		2.2 tors/yr		₽M	2.2 tom/y	,	2.7 tensiye	
i.8 torwyr	-	1.8 tons/yr		PM-10	L.# tons/y	, [). Il torne/y:	•
25.9 tona/yr		25.9 tons/yr		eo'	25.9 tons/y.	, ,	25.9 tom/ys	•
99.0 tone/ye		99.0 tone/yr		NO _x	99.0 torm/y	.	99.0 tom/ye	
16.1 torns/yr	ı	16.1 tons/yr	1	\$Oz	Id.1 tone/ye	r	16.1 torm/yr	
3.2 tenebr.		3.2 torm/yr		TOC	3.2 tom/y	r	3.7 tone/yr	
				Totals:				
325 (опь/уг		99 tana/yr		PM	325 loew/ye		99 tors/y/	
125 total/gr	<u> </u>	39 tanah		PM-10	125 tone ye	<u> </u>	39 tons/yr	
324.8 [=] TAx		99.0 [#] T/yr		PIE Sermary	324.8 [=] 7/2	e 1	99.0 [=] T/y	7
of PM	1	of PM	}	,	of PM		of PM	
Enforcestile Limits Attaliu	orel Areas				Enforceable Limits Non-,	Attainment Azeas		
24.9	ter/day	4,946	lar/ye	Generator	24.0	hrw/day	4,946	her/
18,800	17/day	1.34	MMT/ye	Creater	18,000	T/day	į. 34	MMT
DEQ Classification:	A2		1		DEO Classification:	A2		

CRUSHER vs. o. DP2/GEF, July 96 Page 1 of 4

Crusher Plant Emission Calculations and Impact Estimates

EMISSION ANALYSIS BASED ON APPLICANT'S DATA

Generales Establisma		**************************************	Аррёсн	atu Dada	Generator	Emérators	Modeled Ale Concentrations Rand On Entered SCREEN'S Data			
	Generator Fundamien Factor	Generator Embalon Rate	Hours of Operation		Hours of		Culculated 34-hr immed	Calculated Annual Impact	Calculated Calculated Amount Impact	
Palletus.	f=1 b-WMB(s		i=lim/day	[-] berivear	Operation Bes/day	The	I+i w/m3	[-] <u>ur/m3</u>	f-LOGer	
PM-10	0.0697 0.0573	8.96 8.74	24.0 34.0			3.92 3.22	N/3 3.9	N/3		
CO	0.8300	10.46	24.0	8,700	251.02	45.50	54.9	10.9	137 2 96 3	
NOx	3,1000			<u> </u>				41,6		
SO: TOC	6.3030 0.1000	6.52 1.29	24.0 24.0	\$,700 \$,700		24.17 1.62		6.5	71.4	

Generalar Emissions			Ge	terator Embedons Regulate	ry Annly	I	Ambient Air Conce	estraliota w/ Backgro	and Values (ag/tal)			
	BRC Stgriffcont Contribution		Scant Contribution	Nan-Attalement Area Significant Contribution			T.				*	
	Evaluation		1	indistan Rates	1	Ambient Air Concent	ration			_	_	
Pellutant			_ <u>l</u>			24-₩	Arment		3-70	B-by	24-hr	Arreal
PM	Above BRC	(2,3 T/yr)	No	(25 T/ye)			······	1	i			
PM-10	Above BRC	(1.5 T/ _P)	No	(15 T/yr)	No	5 ug/ян3	i ug/mi	11,537		100000000000000000000000000000000000000	19.9	33.3
co	Above BRC	(10 T/yr)	No	(100 T/yr)	No	2000 ug/m3	500 ug/m3	11,537		5,226		
			<u> </u>		1	(1-hour)	(t-hour)					
NO.	Above BRC	(4 T/yr)	Significant	(40 T/yr)	Ι	•] ^~~~~~~~		1 25 0 S 2 (SS)	(1946)	1 cert 11.6
\$02	Above BRC	(4 T/yr)	No	(40 T/yr)	1]	620		174.2	10.3
TOC					1]				

Rock Creater Emissions	Cru	ives .	Scri	ema)	Transfer	Pokulat	Tekn
	Nes 1 & 2	Not 3 - 4	Net 1 A 2	Nes. 1 - 4	No. 1 - 14	Nea 15 - 28	Zania dan
No. Units	7	7	2	2	14	Į 4	
Throughput ([*] T/hr/mit)	750	563	750	563	730	375	
Operation Schedule ([=] has/day)	24		l				
Peroughput ([*] MM T/je/usit)	4.53	4.89	6.53	4.89	6.51	3,26	
Operation Schedule ([=] tra/yr)	8,796		Į.				
Control Efficiency	70%	70%	70%	70%	70%	70%	
PM: 10							
Emission Fectors	0.0003	8.0074	8.6150	8,9718	6,9620	0.0020	
Uncontrolled Emissions (=) Betr)	0.40	2.70	22.50	79,84	21.19	10.59	137.3
Controlled Emissions (#1 lb/ts)	0.12	0.83	6.75	23.96	4,34	3.18	41.2
Uncontrolled Emissions (#1 T/yr)	1.7	t1.7	97.9	347,5	92.2	46.1	597.1
Controlled Emissions ([7] T/yr)	6.0	3.5	29.4	104.2	27.6	13.8	179.1
PM	1		Ĭ			i i	
Emission Factors	0.9007	0.0063	0.0394	0.1864	0.9053	0.0053	
Uncontrolled Emissions (#4 flats)	1.95	7,09	59.96	209.67	55,99	28.00	360.9
Controlled Emissions (*) lb/ls)	0.32	2.13	17,72	62.98	16.50	2.40	106.3
Uncontrolled Emissions (= Toy)	4.6	30.9	256.9	912.1	243.6	121.8	1,569.2
Controlled Emissions (= T/yr)	1.4	9.2	77.1	273.6	73.1	36.5	470.9

620	
or information pures Crusher Hours to Yield 99.0	ness. of Operation Tyr Excissions
w/a Cenerator	
	2700
	he s/yr
4809	4652
1 82 9	1757

	Generalor	Taskdom	Crusher Emiss	nu (Controlicé)	Total Emissions		
Pallutani	To de la	T/99	B/day	Tży	- Br/dex	The	
PM	21.60	3.92	2599.3	470.9	2619.8	474.8	
PM-10	17.76	3.22	989.2	179.1	1096.0	147.3	
co	251.02	43,50			251.4	45.5	
NO.	960,70	174.13			960.7	174.1	
5 02	136,50	28,37			156.5	28.4	
(IXC	30.99	1.62			31.4	2.6	

,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
Enforcemble Limits	•				1
Generator Operation	24.0	. :::::::::::::::::::::::::::::::::::::	8,700	terlyr	
Crumer - Production	18,900	o "/h∎	6.53	MACA	

Notes:

1 Number of Screens ** Number of Crushers

2 Number of Transfer Points ** 7*(Numbers)

3 Emission Factors from AP 42, Table 11.19.2-2. Where factors were given for one pollutant, the following conversion factors were used:

TSP ** PM to **2.1; TSP ** PM **0.8

Hourly values are based on maximum daily production rates given above. Annual values are based on throughput values given above.

EMISSION ANALYSIS -- BASED ON AMBIENT AIR QUALITY STANDARDS

Emissions haded to less them:

100 Tem/yr

Attainment Area	and the second second second										
					Calculated Impacts		Allowable Inspects				Maximum
					O\$	< 100 TPY;	Generalor	Generalar	Crusher	< 100 TPY)	Theretagness
1	Generator	Generator	Hours of	liours of	Hours of	Hours of	Hours of	Hours of	Hours of	Ceic	Interi
	Estimate Fector	Emission State	Operation	Operation	Operation	Operation	Operation	Operation	Operation	¥	done I
Tolera	E- In Ministra	1=136/br	i-lite/day	1=1 le/mar	i-i Other	i-1)#/new	J+Ehr/dev	ini be/year		I*) ten/mer	i=1.MMIZ2334c
PM	0.0697	0,90	N/3	ጀ		8,760	24.0	4,946	1,788	99.00	1.34
PM-10	0.0573	0.74	24.0	1,760		2,760				38.64	3.54
CO	6.8106	10.46	N/S	N/s	1.0 z	8,760				25.87	
					8.0 1	1					<u> </u>
₽VCx	3.1000	40.03	NS	\$,760		4,946				99.00	
\$O2	0.5050	6.52	24.0	\$,760	3.0 4	1,760				14.13	
froc	0.1500	1.29	N/S	N/3		8.760				3,19	
		,,_		*********		***************************************	•			***************************************	

		Generator :	, missions		·	Ambient Air Core	entrations w/ Backgros	and Values (ug/m3)	
				Band	On Sintered SCREEN	Data .			
i .	Cukrateted	Calculated	Calculated		ĺ				
	24-br Impact	Arount Impact	lament.				_		
Political	[*] <u>se/mil</u>	[* Mar/1953 [†]	[+] Other		1-}∗	3-h	\$·h] 24-₹4	Amu
FM	No	N/S							
PM-10	3.9	0.4			0 3,8 % 3 3,2 9 11,537			1 500	19. 14. 4
co	54.9	6.2	137 7		11,537		5,226		
			96.3						
NOs	216.2	23.7				100 may 1 may 1		178	- 4
5 02	34.2	3.9	77.4			610		178	27.4
roc	6.1	0.6			·				

	Cree	dert	Servenki .		Transfer Paints:		Total	Allowable Figure of C	Allowable Figure of Operation	
	Net, I & 2 Net, 3 - 4 P		Not. 1 A 2 Not. 3 - 4 P		Nes. 1 - 14 Nes. 15 - 28		Emission	w/ Emissions <100 T/yr		
No. Units	2	2	2	2	14	L4		₩/o	w	
Theroughput (™ T/te/tesk)	750	563	750	563		375		Contrator	General or	
[hroughput ([**] MM T/ye/usik)	1.34	1.01	1.34	\$,01	1.34	0.67				
Operation Schedule (##bra/yr)	1,784.									
Control Efficiency	79%	70%	70%	70%	70%	70%				
PM-19									i	
Estitution Factor)	2,0003	0.0624	0.03.50	0.0710		0,0620				
Uncontrolled Emissions ([w] th/le)	0.49	2.78	22.50	79,88	21.19	10.59	137.3			
Controlled Emissions ([=] lb/hr)	0.12	0.81	6.75	23.96		3,18	41.2	4809	4720	
Uncontrolled Entitations ([14] T/yr)	0.4	2.4	20.1	71.4	18.9	9.5	122.7			
Controlled Emissions ([#] T/ye)	0.1	0,7	6.0	21.4	3.7	2.8	36.8			
РМ										
Essission Factors	0.0007	0.9063	8.8394	0.1864		0.0053			- 1	
Uncontrolled Estimates ([+] Rule)	1.43	7,09	59.06	209.67		26.00	360.9			
Controlled Emirations ([==] fb/hr)	0.32	2.13		42.90			[OB.3	1929	1788	
Uncontrolled Emissions ((*) T/yr)	0.9	6.3	52.0	187.4		25.0	122.6			
Controlled Equiptions (1=1 Thr.)	6.3	1.9	13.6	36.2	13.0	7.5	95.8			

- Controlled Extensions to hade crusher, screen and transfer point aministem.

 1 PV a decisiations include crusher, screen and transfer point aministem.

 2 CO 1-b Averaging Period.

 3 CO 3-b Averaging Period.

 3 CO 3-b Averaging Period.

 5 CO 4-b Averaging Period.

 Early and annual operation values are based on background data less the modeled generator emissions (i.e., ambient air concentrations).

 That is, the generator bours of operation have been back-calculated from AAQS values. The crusher particulate emissions (controlled) are then used to back-calculate crusher operational times, assuming 99 Tomslye less generator emissions.

 Administration throughout values are based on the minimum number of hours (crusher) that will yield a total of 99 Tomslye, multiplied by the matrimum dailly production rates.
- maximum daily production runes.

 Hourly emission values are based on maximum daily production runes, given above.

 Assusal emission values are based on the maximum throughput values given above.

EMISSION ANALYSIS - BASED ON AMBIENT AIR QUALITY STANDARDS

Emissions Resided to less than:

100 Tens/yr

Nes-Atlahenred Aves											
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,]				Culculated Impacts				Allowabie Impecta		Maximum
1					QS	< 100 TPY:	Generator	Generaler	Creaher	< 100 TPY:	Throughput
	Generator	Generater	Hears of	Hears of	Hours of	Hours of	15a4075 0.1	Hours of	Hears of	Calc	antiret t
	Emisson Pactor	Tentralen Rufe	Operation	Operation	Operation	Operation	Operative	Operation	Operation	l limit	
Palutani	K-18/80-br		i=ibr/day	i+lactrear	I+1 Other	I-therrear	l-i hr/day	1=1 hr/rear	I-11s/ess	in teninger	E-LMOME/HIME
PV .	8.9697	0.90	ነ /\$	N/S		1,760	24.0	4,946	1,784	99.00	1.34
PM-10	0.0373	9,74	24.0	6,760		3,760				32,64	3.54
co	0.8100	\$8.46	N/S	NA	1.9 2	£.76¢				25.87	-
					E.O 3	i	İ				1
NO ₂	3,1000	40.83	N/S	\$,760		4,946				99.00	
501	0.5050	6.52	24.0	8,760		8,760				16,13	
TOC	0.1900	1,29	N/S	N/S		\$,769				3.19	
			···	······			•				

		Getaerstor 1	Francisco		Acciding Air Concentrations of Sactoround Values (up/m3)						
1			,Be	uden Briend SCREEN	On Belleved SCREEN Date						
1	Culcuinted	Colculated Calculated Calculated									
	24 hr kespect Ameual impact impact										
Polisiani	i-luciani	i-i-u/mi	[+] Other	३ श्रेष	3-29	8-lw	24-14	Antual			
PM	N/S	N/S									
PM-10	3.9	0.4				# PROCESSORY (1971)	2228. AXXXX	Park Chaberrille			
co	54.9	6.7	137 2	11,53?		3,226					
			96 x								
84Or	219.2	23.7					Selection and	2 y 10 10 4 10 2 4			
SO2	34.2	3.9	. 77 +		470		178	27.4			
TOC	6.8	9.8		1							

	Cnuben		Screen:		Tenneler Politica		Tele	Altowable Hours of Operation	ours of Operation	
	No.141	Net. J - 4	Ne. 1 & 2	Net 3 - 4	N46. J. 14	Nov. 15 - 28	Enhánn	w Emissions <100 T/ye		
No. Unite	2	2	2	2	14	14		w/s	144	
Throughput ([10] T/hr/unit)	750	363	750	563	730	375		Omerica G	and More	
Throughput ([w] MM Through)	1.34	1.91	1.34	1.01	1.34	0.67				
Operation Schedule ([=]Ars/yr)	1,788									
Control Efficiency	70%	70%	70%	70%	70%	70%				
PM-18							ĺ			
Estimation Factors	0.9063	5.9324	0.0138	0.0718		0,0020				
Uncontrolled Emissions ([11] Halls)	9.40	2.70				10.59	137.3			
Controlled Emissions ([**] 25/7e)	0.12	0.91	6.75	23.96		3.19	41.2	8250	4720	
Uncontrolled Emissions ([4] T/yr)	8.4	2.4	20.1	71.4		9.5	1227		- 1	
Controlled Emissions (i*) T/yr)	8.1	0.7	6.9	71.4	5.7	2.1	36. e			
PX					· ·					
Emission Factor)	0,0007	9.9963	0.0394	9.1864		6.0653				
Uncontrolled Essimions ([*] Hvfsr)	1.65	7.09	59.06	209.67		78.00	360.9			
Controlled Embatons ([=] \$2/hr)	0.32	2.13	17.72	62.90		\$40			1788	
Uncontrolled Emissions (== T/yr)	0.9	6.3	52.0	187.4		25.0	322.6			
Controlled Emissions (I=1 TAn)	63		13.0	56.2	15.0	7.5	76.B			

Notes: sTPY calculations include crustier, screen and transfer point emissions.

2 CO 1-by Averaging Period 3 CO 8-by Averaging Period

3 CO 8-by Averaging Period
4 SO2 3-by Averaging Period
5 The 5s, the generator hours of operation have been back-calculated from AA(5) values. The cruster perficulate entistions (controlled) are then used to beck-calculate cruster operationed than a controlled on the same to be calculated cruster operationed than a cannot go Possy's values. The cruster perfections entises.
— Maximum throughput values are based on the minimum number of hours (cruster) that will yield a total of 99 Tons'ys, multiplied by the maximum deely production rates.
— Hourly anisators values are based on the maximum diving production value; given above.
— Montal anisator values are based on the maximum throughput values given above.
— Non-Actainment Area hour of operation calculations assume TSP emissions are mon-calculationed in Phf-10 mon-calculations are provided in limited by significant impact limits.

non-estainment areas. Therefore, operation is limited by significant impact limits

APPENDIX B

July 27, 1998

MEMORANDUM

TO:

Robert Wilkosz, Bureau Chief, Technical Services Bureau (TSB)

FROM:

Krishna Viswanathan, Air Quality Engineer, TSB

THRU:

Matt Stoll, Sciences Manager, TSB

SUBJECT:

Control technology (CT) analysis for Bannock Paving Company

Summary:

The qualitative CT analysis for Bannock Paving Inc. confirms that the controls enforced by the currently proposed Tier II operating permit meet Best Available Control Technology (BACT) classification for some sources and RACT for some other sources. This level of control adequately provides for compliance with all applicable air standards even when sources are collocated in a nonattainment area (most conservative case), as evidenced by the permit analysis. It should be noted that this memorandum does not constitute a comprehensive control technology assessment for Bannock Paving Inc. This qualitative analysis was performed based on USEPA guidance for BACT and RACT determinations, and the Rules for Control of Air Pollution In Idaho (Rules).

Analysis:

Asphalt Plant: The proposed Tier II operating permit limits the PM emissions from the hot-mix asphalt dryer stack to a grain loading standard of 0.04 grains/dry standard cubic foot (gr/dscf). This is comparable to the most stringent standards listed for Asphalt Plants in the RACT guideline document. The handling and process PM emissions are also subject to the same standard of 0.04 gr/dscf. The exhaust from the dryer stack is vented through a baghouse with a rated control efficiency of 99%, and is considered BACT for such sources by EPA's RACT/BACT/LAER Clearinghouse (RBLC). Open area fugitive emissions (roads, piles) are controlled using reasonable control options as specified in the rules (IDAPA 16.01.01.651).

In addition, there is requirement of zero visible emissions at the property boundary. This limitation is also consistent with the most stringent standards described in the RACT guideline. Therefore, most of the emissions from the Asphalt Plant are controlled using technology considered to be BACT, and all sources are controlled using RACT.

Rock Crusher: The Tier II operating permit restricts opacity from the crusher to 15%, and transfer point opacity to 10%, determined using methods specified in the "Procedures Manual for Air Pollution Control" for the state of Idaho. Conveyors and transfer points will be controlled by application of water when necessary. Open area fugitive emissions (roads, piles) are controlled using reasonable control options as specified in the rules (IDAPA 16.01.01.651).

General: In the permit analysis there are emission limits specified for the worst case operations scenario, when two pieces of equipment (crusher and asphalt plant) are collocated in a nonattainment area. The analysis is performed using a screen model with pertinent assumptions about fugitive emissions. This conservative case does not violate the NAAOS due to controls specified and also because the limited hours of operation, on the short term basis. The application of reasonable control per the rules adequately controls emissions from roads, storage piles, and associated activities.

<u>Conclusion:</u> Conservative analysis by modeling and literature search indicates the Tier II operating permit proposed for issuance to Bannock Paving Company provides for an adequate level of control consistent with the need to meet the national ambient air quality standard (NAAQS) in a nonattainment area.

CC: Bannock Paving - Source File Yihong Chen COF



*** SCREEN3 MODEL RUN ***

*** VERSION DATED 95250 ***

Bannock Paving Cedarapids #1 Tier II OP 777-00140

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT EMISSION RATE (G/S) = .126000 STACK HEIGHT (M) = 11.8800

STK INSIDE DIAM (M) 1.5750 STK EXIT VELOCITY (M/S) 8.0895 STK GAS EXIT TEMP (K) = 400.0000 AMBIENT AIR TEMP (K) = 293.0000 RECEPTOR HEIGHT (M) 1.5000 URBAN/RURAL OPTION RURAL BUILDING HEIGHT (M) .0000 MIN HORIZ BLDG DIM (M) .0000 MAX HORIZ BLDG DIM (M) =.0000

STACK EXIT VELOCITY WAS CALCULATED FROM VOLUME FLOW RATE = 33395.000 (ACFM)

BUOY. FLUX = 13.160 M**4/S**3; MOM. FLUX = 29.727 M**4/S**2.

*** FULL METEOROLOGY ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

	DIST	CONC	U10M	USTK	MIX H	r plume	SIGMA	SIGMA		
	(M)	(UG/M**3)	STAB (M/S)	(M/S)	(M)	HT (M	(M) Y	Z (M)	DWASH	I
•				****			******			
	1,	.0000]	1.0	1.0	320.0	158.14	2.17	2.14	NO
	100.	.3692	3	10.0	10.2	3200.0	24.21	12.67	7.78	NO
	200.	2.952	4	20.0	20.5	6400.0	15.61	15.67	8.69	NO
	300.	3.137	4	20.0	20.5	6400.0	15.61	22.70	12.27	NO
	400.	2.809	4	15.0	15.4	4800.0	18.43	29.58	15.51	NO
	500.	2.520	4	10.0	10.3	3200.0	24.06	36.38	18.76	NO
	600.	2.268	4	10.0	10.3	3200.0	24.06	42.92	21.61	NO
	700.	2.073	4	8.0	8.2	2560.0	28.29	49.46	24.58	NO
	800.	1.874	4	8.0	8.2	2560.0	28.29	55.81	27.27	NO
	900.	1.689	4	5.0	5.1	1600.0	40.73	62.43	30.60	NO
	1000.	1.616	4	5.0	5.1	1600.0	40.73	68.62	33.13	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M: 253, 3.254 4 20.0 20.5 6400.0 15.61 19.51 10.66 NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED

** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

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07/08/98 10:58:13

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*** SCREEN3 MODEL RUN ***

*** VERSION DATED 95250 ***
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Bannock Paving - Crusher #1, with 7/8/98's infor from facility

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SIMPLE TERRAIN INPUTS:
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SOURCE TYPE = POINT EMISSION RATE (G/S) = .126000 STACK HEIGHT (M) 4.1148 STK INSIDE DIAM (M) = .1524 STK EXIT VELOCITY (M/S)= 159.6316 STK GAS EXIT TEMP (K) = 827.6000AMBIENT AIR TEMP (K) = 293.0000RECEPTOR HEIGHT (M) = 1.5240 URBAN/RURAL OPTION = RURAL .0000 BUILDING HEIGHT (M) = MIN HORIZ BLDG DIM (M) = .0000 MAX HORIZ BLDG DIM (M) = .0000

STACK EXIT VELOCITY WAS CALCULATED FROM VOLUME FLOW RATE = 6170.0000 (ACFM)

BUOY. FLUX = 5.871 M**4/S**3; MOM. FLUX = 52.384 M**4/S**2.

*** FULL METEOROLOGY ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST CONC U10M USTK MIX HT PLUME SIGMA SIGMA (M) (UG/M**3) STAB (M/S) (M/S) (M) HT (M) Y (M) Z (M) DWASH

1. .0000 1 1.0 1.0 320.0 84.93 3.19 3.17 NO 100. 12.81 4 20.0 20.0 6400.0 8.16 8.25 4.74 NO 4 10.0 10.0 3200.0 12.20 15.73 8.81 NO 200. 11.25 4 8.0 8.0 2560.0 14.22 22.79 12.43 NO 300. 9.222 400. 7.540 4 5.0 5.0 1600.0 20.28 29.81 15.95 NO 500. 6.552 4 5.0 5.0 1600.0 20.28 36.44 18.87 NO 4 4.0 4.0 1280.0 24.32 43.11 21.98 NO 600. 5.742 700. 5.108 4 3.5 3.5 1120.0 27.20 49.63 24.92 NO 4 3.0 3.0 960.0 31.05 56.10 27.87 NO 800. 4.598 4 3.0 3.0 960.0 31.05 62.36 30.45 NO 900. 4.186 4 2.5 2.5 800.0 36.44 68.75 33.40 NO 1000. 3.854

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M: 114. 13.13 4 20.0 20.0 6400.0 8.16 9.38 5.34 NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED

** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
